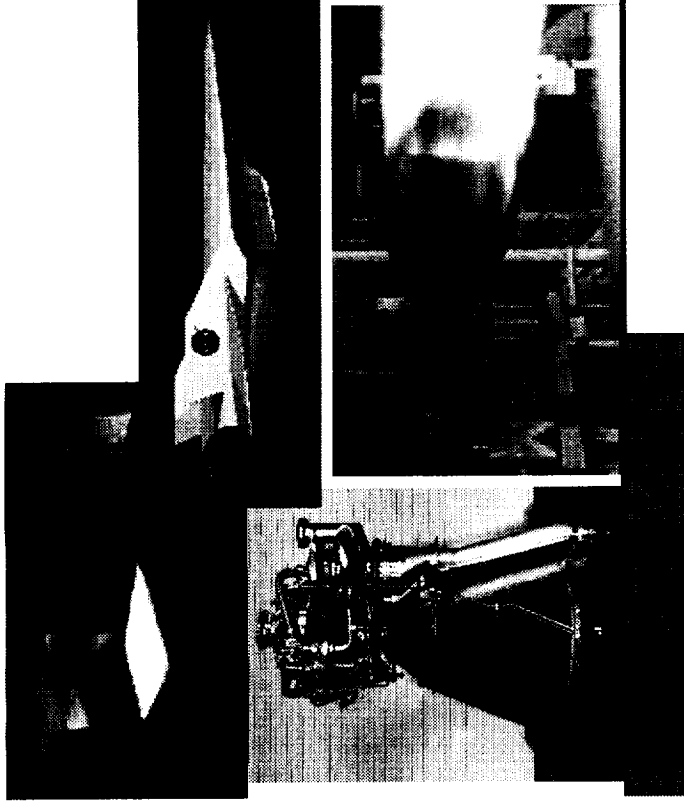


4P

# **Light Weight Long Life Materials and Structures**

Tom Glasgow  
Oct. 12, 2000

*Space Transportation Technology Workshop*



- ♦ Basic work to be performed at GRC, MSFC, LaRC
- ♦ Contracts for CMC Panels, Blinks and Thrust Chambers, for Copper Alloy Fabrication and Polymer Production , will be arranged with materials Specialty Companies
- ♦ Academia will be involved in Polymers and Copper Alloy Development Opportunities to participate will also be advertised through SBIR

#### ♦ FY'01 Milestones

- Complete experimental design for high conductivity alloy development
- Define and characterize prototype CMC Nozzle Sub-elements
- Complete survey of Gen 3 Vehicle Needs for leading edges
- Initiate Design of High Fidelity Quick Access Rocket Exhaust Exposure Rig

#### ♦ FY'02 Milestones

- Demonstrate Reaction Transfer Molded PMC with 550°F use Temp Complete Screening of Advanced Copper Alloys
- Determine thermal performance of First Concept Cooled CMC Panels
- Screen regeneratively cooled concepts for CMC Thrust Chambers

#### ♦ Prioritized list of Activities, e.g.:

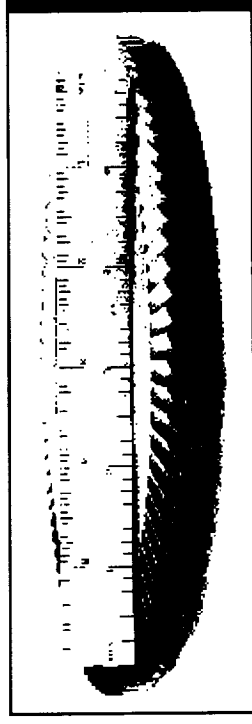
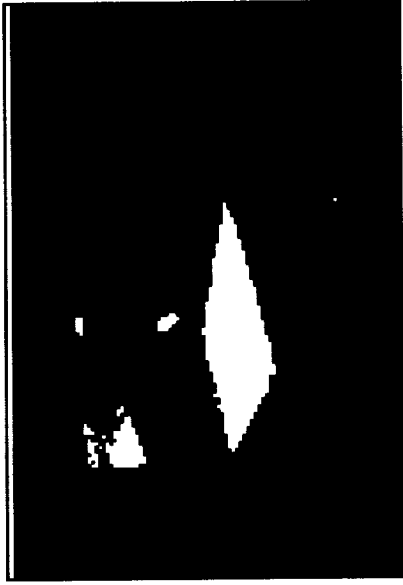
- Establish Low Fidelity Materials Exposure Rig
- Establish contacts for supply of CMC test pieces
- Select Polymer concepts for 550°F use temp.

- ♦ Extensive use of GRC Cell 22 Rocket Test Facility will be required in out years but not FY01
- ♦ No use of Industry facilities is anticipated

# Long Life Light Weight Propulsion Materials and Structures

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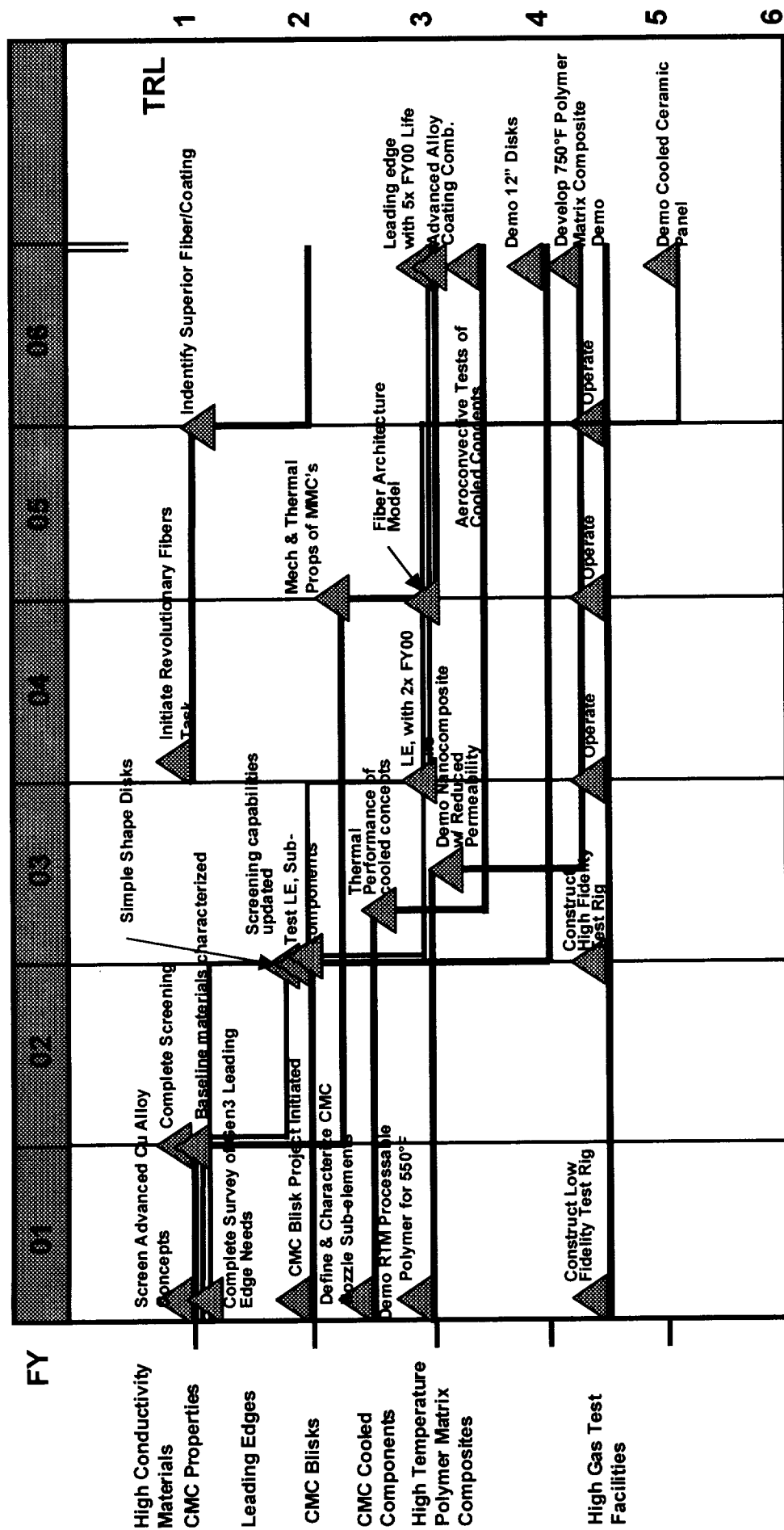
- ♦ High performance materials are enabling or enhancing for numerous engine/vehicle concepts and are critical to meeting safety, cost and performance goals.
- ♦ Subproject covers polymeric, metallic and ceramic high temperature materials for rocket propulsion systems.
- ♦ Current TRL's average 2.5. Most will attain 5 or 6 by 2006. Project also includes a wide variety of efforts with some fundamental work with late maturity dates.



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## **Long Life, Light Weight Propulsion Materials and Structures**



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# Long Life, Light Weight Propulsion Materials and Structures